

What is claimed is:

1. An isolated nucleic acid encoding a fusion polypeptide, wherein the fusion polypeptide comprises:
 - (a) one or more domains which comprise a cellular co-receptor protein, or a fragment, derivative or functional equivalent thereof (CCR);
 - (b) one or more domains which comprise a cellular receptor protein, or a fragment, derivative, or functional equivalent thereof (CR); and optionally
 - (c) a fusion component (FC), and
 - (d) one or more domains of a viral protein, or a fragment or derivative thereof (VP).
2. The isolated nucleic acid of claim 1, wherein CCR is one or more protein(s) selected from the group consisting of (i) human CCR5, or a fragment, derivative or functional equivalent thereof, (ii) human CXCR4, or a fragment, derivative or functional equivalent thereof, and (iii) a lectin-binding receptor.
3. The isolated nucleic acid of claim 2, wherein a functional equivalent of (i) or (ii) is an immunoglobulin variable region or fragment thereof immunospecific for a viral protein which interacts with (i) or (ii).
4. The isolated nucleic acid of claim 2, wherein the fusion polypeptide comprises more than one CCR domain which are the same or different proteins.
5. The isolated nucleic acid of claim 1, wherein CR is one or more protein(s) selected from the group consisting of (i) human CD4, or a fragment, derivative or functional equivalent thereof, and (ii) a lectin-binding receptor.
6. The isolated nucleic acid of claim 5, wherein a functional equivalent is an immunoglobulin variable region or fragment thereof immunospecific for a viral protein which interacts with CD4.
7. The isolated nucleic acid of claim 5, wherein the human CD4 fragment comprises Ig-like domain 1, or a fragment or derivative thereof capable of binding gp120.
8. The isolated nucleic acid of claim 5, wherein the fusion polypeptide comprises more than one CR domain which are the same or different proteins.

9. The isolated nucleic acid of claim 1, wherein FC is selected from the group consisting of a multimerizing component, fusion partner, a targeting protein, a serum protein, or a molecule capable of binding a serum protein.

10. The isolated nucleic acid of claim 9, wherein the multimerizing component is selected from the group consisting of (i) an immunoglobulin-derived domain, (ii) a cleavable region (C-region), (ii) an amino acid sequence between 1 to about 500 amino acids in length, optionally comprising at least one cysteine residue, (iii) a leucine zipper, (iv) a helix loop motif, and (v) a coil-coil motif.

11. The isolated nucleic acid of claim 10, wherein the immunoglobulin-derived domain is selected from the group consisting of the Fc domain of IgG, the heavy chain of IgG, and the light chain of IgG.

12. The isolated nucleic acid of claim 11, wherein the Fc domain of IgG is human FcΔ1(a).

13. The isolated nucleic acid of claim 1, wherein VP is a viral receptor.

14. The isolated nucleic acid of claim 13, wherein the viral receptor protein is gp41 or a fragment or derivative thereof.

15. A fusion polypeptide encoded by the isolated nucleic acid of claim 1.

16. The fusion polypeptide of claim 15, selected from the group consisting of SEQ ID NO:1-9.

17. A method of producing a fusion protein, comprising culturing a host cell transfected with a vector comprising the nucleic acid of claim 1, under conditions suitable for expression of the protein from the host cell, and recovering the fusion protein so produced.

18. The fusion polypeptide of claim 15 which is a dimer.

19. A fusion polypeptide, comprising:

(a) one or more domains which comprise a cellular co-receptor protein, or a fragment, derivative or functional equivalent thereof (CCR);

(b) one or more domains which comprise a cellular receptor protein, or a fragment, derivative, or functional equivalent thereof (CR); and optionally

(c) a fusion component (FC), and

(d) one or more domains of a viral protein, or a fragment or derivative thereof (VP).

20. The fusion polypeptide of claim 19, wherein CCR is one or more protein(s) selected from the group consisting of (i) human CCR5, or a fragment, derivative or functional equivalent thereof, (ii) human CXCR4, or a fragment, derivative or functional equivalent thereof, and (iii) a lectin-binding receptor.

21. The fusion polypeptide of claim 20, wherein a functional equivalent of (i) or (ii) is an immunoglobulin variable region or fragment thereof immunospecific for a viral protein which interacts with (i) or (ii).

22. The fusion polypeptide of claim 20, wherein the fusion polypeptide comprises more than one CCR domain which are the same or different proteins.

23. The fusion polypeptide of claim 19, wherein CR is one or more protein(s) selected from the group consisting of (i) human CD4, or a fragment, derivative or functional equivalent thereof, and (ii) a lectin-binding receptor.

24. The fusion polypeptide of claim 23, wherein a functional equivalent is an immunoglobulin variable region or fragment thereof immunospecific for a viral protein which interacts with CD4.

25. The fusion polypeptide of claim 24, wherein the human CD4 fragment comprises Ig-like domain 1, or a fragment or derivative thereof capable of binding gp120.

26. The fusion polypeptide of claim 23, wherein the fusion polypeptide comprises more than one CR domain which are the same or different proteins.

27. The fusion polypeptide of claim 19, wherein FC is selected from the group consisting of a multimerizing component, fusion partner, a targeting protein, a serum protein, or a molecule capable of binding a serum protein.

28. An HIV-specific protein capable of binding an HIV viral particle and/or blocking the ability of an HIV viral particle to infect a cell comprising two of the fusion proteins of claim 19.

29. A pharmaceutical composition comprising the HIV-specific fusion protein of claim 28 and a

pharmaceutically acceptable carrier.

30. A therapeutic method for treating an HIV infection in a subject in need thereof, comprising administering the pharmaceutical composition of claim 29.

31. The therapeutic method of claim 30, wherein the subject is a human suffering from or at risk for infection from HIV.

32. A therapeutic method for reducing a viral load of a patient suffering from HIV infection, comprising administering the pharmaceutical composition of claim 29.